



Complete Summary

GUIDELINE TITLE

Evidence based clinical practice guideline for management of children with mild traumatic head injury.

BIBLIOGRAPHIC SOURCE(S)

Cincinnati Children's Hospital Medical Center. Evidence based clinical practice guideline for management of children with mild traumatic head injury. Cincinnati (OH): Cincinnati Children's Hospital Medical Center; 2000. 9 p. [69 references]

COMPLETE SUMMARY CONTENT

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SCOPE

DISEASE/CONDITION(S)

Mild traumatic head injury

GUIDELINE CATEGORY

Evaluation
Management

CLINICAL SPECIALTY

Emergency Medicine
Family Practice
Neurological Surgery
Neurology
Pediatrics
Physical Medicine and Rehabilitation
Surgery

INTENDED USERS

Advanced Practice Nurses
Nurses
Physician Assistants
Physicians
Utilization Management

GUIDELINE OBJECTIVE(S)

To provide the most current information and evidence-based recommendations for clinicians evaluating children with mild traumatic head injury.

TARGET POPULATION

The target population includes

- Any child, 1 month through 17 years of age, with an acute mild traumatic head injury and a Glasgow Coma score (GCS) of 13 to 15.

Excluded Patients

- A requirement for hospitalization because of other injuries or comorbid conditions.
- Suspicion or proof of child abuse.
- Other conditions which, in the practitioner's opinion, add exceptional uncertainty to care decisions to a degree beyond the scope of this guideline.

INTERVENTIONS AND PRACTICES CONSIDERED

Immediate management of mild traumatic head injury:

1. History and physical examination, including determination of the Glasgow Coma Score
2. Computed tomograph study
3. Observation in the hospital
4. Observation at home
5. Special considerations for grading and managing head injuries during competitive sports

MAJOR OUTCOMES CONSIDERED

Not stated

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Evidence Based Grading Scale:

A: Randomized controlled trial: large sample

B: Randomized controlled trial: small sample

C: Prospective trial or large case series

D: Retrospective analysis

E: Expert opinion or consensus

F: Basic laboratory research

S: Review article

M: Meta-analysis

Q: Decision analysis

L: Legal requirement

O: Other evidence

X: No evidence

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

The recommendations contained in this document were formulated by a working group that included community and hospital based physicians, nurses, respiratory therapists, and others, who examined current local clinical practices and performed extensive and critical literature reviews.

During formulation of these guidelines, the committee members have remained cognizant of controversies and disagreements over the management of these patients. They have tried to resolve controversial issues where possible and, when not possible, to offer optional approaches to care in the form of information that includes best supporting evidence of efficacy for alternative choices.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

The guidelines have been reviewed and approved by senior management, Legal Services, the Institutional Review Board, the hospital's Pharmacy and Therapeutics, Clinical Practices, Executive, and other committees and other individuals as appropriate to their intended purposes.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Each recommendation is followed by evidence grades (A-X) identifying the type of supporting evidence. Definitions of the evidence grades are presented at the end of the Major Recommendations field.

1. If a child has no obvious skull deformity distinct from any scalp laceration, hematoma, or edema, was not unconscious, is not confused, is interactive, responsive to commands, and otherwise neurologically normal, consider deferring further evaluation pending a period of observation at home. This

- recommendation is strongest for children older than 1 year who are at lowest risk for covert brain injury (Livingston et al., 1991 [C]; Dietrich et al., 1993 [C]; Dahl-Grove, Chande, & Barnoski, 1995 [D]; Roddy Sean et al., 1998 [D]; Benito et al., 1998 [C]; Gruskin & Schutzman, 1999 [C]).
2. Physical assessment is strongly recommended for any child reported to have any signs or symptoms suggestive of neurologic dysfunction, or when verbal descriptions produce medical uncertainty about the child's condition. This recommendation is strongest for infants 1 year of age or less who are documented to be at higher risk for covert brain injury (Greenes & Schutzman, 1998 [D]; Quayle et al., 1997 [C]; Gruskin & Schutzman, 1999 [C]; Local community expert consensus).
 3. A CT study is recommended as the preferred study for all children with neurologic or cognitive dysfunction, or suspicion of a depressed or basilar skull fracture. About 22% of those with a history of unconsciousness >5 min might have brain injury. 92% without > 5 min unconsciousness will have no brain injury. When a CT study is not performed in any child 1 year of age or younger (e.g. due to concerns about the use of anesthesia), a skull film might be considered. Otherwise skull films are not recommended unless there is specific use for the resulting information, as in suspected child abuse. (Harwood-Nash, Hendrick, & Hudson, 1971 [C]; Stein & Ross, 1992 [C]; Dietrich et al., 1993 [C]; Quayle et al., 1997 [C]; Ramundo et al., 1995 [D]; Lloyd, 1996 [B{Abstract}]; Toupin et al., 1996 [C]; Gruskin & Schutzman, 1999 [C]; Murshid, 1998 [D]).
 4. A child with a Glasgow Coma Score (GCS) of 14-15 and normal CT study is at near zero risk of having an occult brain injury and, if neurologically stable, can be considered a candidate for home observation. Stein & Ross, 1992 [C]; Dietrich et al., 1993 [C]; Quayle et al., 1997 [C]; Ramundo et al., 1995 [D]; local community expert consensus).
 5. An abnormal CT scan, other findings leading to suspicion of a brain injury, or uncertainty about diagnosis and management are considered appropriate indications for considering consultation with a neurosurgeon. (Johnstone et al., 1993 [C]).
 6. It is recommended that hospitalization be considered for any child with neurologic dysfunction or comorbid conditions creating diagnostic and management uncertainties. This includes cases in which history of drug use or presence of chronic neurologic abnormalities prior to injury confounds evaluation of the patient. Hospitalization is also appropriate when family resources limit confidence that the child can be adequately observed at home (Livingston et al., 1991 [C]; Nagy et al., 1999 [C]; Johnstone et al., 1993 [C]).
 7. For in hospital observation, it is recommended that practitioners consider ordering periodic neurologic checks only for those patients at high risk of neurologic deterioration. Neurologic checks are recommended for those with a GCS < 15, or an abnormal CT study, or with neurologic dysfunction at the time of admission. [Evidence Grade: consensus opinion of local experts].

Recommended Discharge Criteria

- When a child being observed in an office or hospital setting is clinically stable, interactive and responsive, oriented to time and place, and has family resources sufficient to finish convalescence at home.

- When the family has been educated and understands the signs and symptoms of progressive brain dysfunction and when to call their physician or when to bring the child to the Emergency department.
- When the primary care physician has been notified and agrees with management decisions.

Head injuries and competitive sports

It is recommended that reinjury to the head prior to recovery from the effects of a preceding injury be considered as an event greatly increasing the likelihood of serious brain injury. It is appropriate in these cases to consider removing an athlete immediately from competition (CDC MMWR, 1997 [O,S,E]).

There are only minor differences between the multiple scales available for grading the potential severity of a head injury. For the sake of community consistency, practitioners are encouraged to use the American Academy of Neurology (AAN) grading and management recommendations when encountering children who have head injuries while engaged in competitive sports. (Colorado Med Soc., 1990 [E]; CDC, 1997 [S,E]; Kelly et al., 1991 [S,E]; Kelly & Rosenberg, 1997 [S,E]; Hugenholtz & Richard, 1982 [O,E], Cantu, 1992 [S,E], Cantu, 1996 [S,E], Fick, 1995 [S,E]; CDC MMWR, 1997 [O,S,E]; Cantu, 1998 [S,E]; Kelly & Rosenberg, 1998 [E]).

It is recommended that any athlete allowed to reenter competition be observed closely for subtle neurologic dysfunction that may not have been discernible when the athlete was examined at rest.

AAN Grade 1 Criteria and management: (Transient confusion, no loss of consciousness, mental status normal within 15-20 minutes)

Remove from sports activity and examine immediately and then at frequent intervals. Allow return to sports activity that day only if postconcussive symptoms resolve within 15-20 minutes.

AAN Grade 2 Criteria and management: (No loss of consciousness, but mental status not normal within 15-20 minutes)

Remove from current sports activity. If persistent or worsening symptoms anytime within a week, evaluate more extensively for traumatic brain damage. Allow returning to sports activity only after one full week following disappearance of all evidence of brain injury. If a Grade 2 injury occurs on the same day subsequent to a Grade 1 injury, it is recommended that return to active sports activities be delayed until asymptomatic for at least 2-4 weeks.

AAN Grade 3 Criteria and management: (loss of consciousness for any period of time)

If there is any evidence of loss of consciousness, it is recommended that the athlete be excluded from all sports activities for at least one to four weeks following resolution of all symptoms of brain dysfunction. If unconscious at the time of initial evaluation, it is recommended that the athlete be transported

immediately to an emergency facility with resources for evaluating and treating serious head injuries. If there are brain abnormalities on neuroradiologic examination, it is recommended that the player be excluded from participation for the remainder of the current sports season; furthermore the athlete should consider refraining from any future return to participation in competitive sports.

Evidence Based Grading Scale:

A: Randomized controlled trial: large sample

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S: Review article

M: Meta-analysis

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L: Legal requirement

O: Other evidence

X: No evidence

CLINICAL ALGORITHM(S)

An algorithm is provided in the guideline document summarizing the recommendations for immediate management of mild traumatic head injury.

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

[References open in a new window](#)

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of evidence is identified and graded for each recommendation (see "Major Recommendations"). In the guideline document, each cited reference is graded individually.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate management of children with mild traumatic head injury.

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

During formulation of these guidelines, the committee members have remained cognizant of controversies and disagreements over the identification and management of patients with mild traumatic head injury. They have tried to resolve controversial issues where possible and, when not possible, to offer optional approaches to care in the form of information that includes best supporting evidence of efficacy for alternative choices.

These guidelines are a set of recommendations resulting from review of literature and practices current at the time of their formulations. This protocol does not preclude using care modalities proven efficacious in studies published subsequent to the current revision of this document. This document is not intended to impose standards of care preventing selective variances from the guidelines to meet the specific and unique requirements of individual patients. Adherence to this guideline is voluntary. The physician in light of the individual circumstances presented by the patient must make the ultimate judgment regarding the priority of any specific procedure.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

The implementation process for each Children's Hospital Medical Center (CHMC) guideline is a phase in a larger process of Guideline Development. This process is utilized for every guideline but is not addressed in the content of every guideline.

At the start of each guideline, a projected implementation date is determined. Reservations for education are then made (Grand Rounds, Patient Services Inservices). When the guideline is complete and enters into the Approval Process, Education planning begins. Changes created by the guideline are outlined as well as anticipated outcomes. The implementation date is confirmed. Education is provided. The guideline is implemented and pilot information collection started. The Guideline Coordinator makes daily rounds and eligible children are followed to document the use of the guideline. The implementation phase aids in finding areas for improvement or question. When issues identified are improved the guideline progresses to the monitoring phase.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2000

GUIDELINE DEVELOPER(S)

Cincinnati Children's Hospital Medical Center - Hospital/Medical Center

SOURCE(S) OF FUNDING

Cincinnati Children's Hospital Medical Center

GUIDELINE COMMITTEE

Minor Traumatic Brain Injury Clinical Effectiveness Committee

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Committee members 1999-2000:

Community Physicians: Steven Muething MD (Chairman); Chris Bolling (Ped. Associates, N. KY); Joe Bailey MD (Queen City Physicians)

CHMC Physicians: Bryan Philbrook MD (Neurology); Victor Garcia MD. (General Pediatric Surgery); Rebecca Brown MD (General Pediatric Surgery); Kieren

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Patient Services and Nursing: Donna Tinker RN (T5B); Karen Burkett RN (Neurosurgery); Jenny Crabtree RN, BSN (ED); Lynn Daum RN (ED); Mary Bellman RN (C5); Carolyn Palmer RN, MSN (ED)

Clinical Effectiveness Support: Betsy Bushman; Wendy Gerhardt RN; Elisa Immerman MBA; Kate Turck; Paul Perlstein MD

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

An update is not in progress at this time.

GUIDELINE AVAILABILITY

Electronic copies: Available from the [Cincinnati Children's Hospital Medical Center](#).

For information regarding the full-text guideline, print copies, or evidence-based practice support services contact the Children's Hospital Medical Center Health Policy and Clinical Effectiveness Department at HPCEInfo@chmcc.org.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

The following is available:

- Mild to moderate head injuries: recommended information for distribution to families discharged from emergency department or inpatient care unit. Cincinnati, OH: Cincinnati Children's Hospital Medical Center, 1998. (Patient Education Pamphlet 1011).

Available online at the [Cincinnati Children's Hospital Medical Center Web site](#).

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for

them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC STATUS

This summary was completed by ECRI on February 14, 2000. The information was verified by the guideline developer on September 22, 2000.

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Date Modified: 11/8/2004

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